



Horticulture in the South Atlantic

INTERNATIONAL HORTICULTURE

Leigh Morris spent the last two years based on the UK overseas territory of St Helena in the South Atlantic Ocean. He was commissioned by the St Helena Government (SHG) to undertake a strategic assessment of the island's agriculture and production horticulture and deliver a programme of development work. He reports on this and on his input into the development of the hydroponic farm on Ascension Island and his further engagement with the microcosm of all things horticultural and conservation on the islands.

The first time I recall being aware of St Helena was in 1994, while I was the Nursery Manager at Pershore College of Horticulture, on a secondment to Kirstenbosch Botanical Garden in Cape Town to develop a plant exchange programme for our Specialist Plant Unit. While there I spent a delightful day botanising on Table Mountain with a young woman who was 'en route to St Helena to carry out botanical research'. She was killing time in Cape Town while she awaited the departure of the monthly Royal Mail Ship (RMS) and I recall being quite envious of this aspiring botanist heading off on a great adventure, with a five-day voyage ahead of her to reach a remote sub-tropical island in the middle of the South Atlantic. The romance and adventure of travelling to St Helena still very much existed for me in January 2018 when I arrived with my wife for our two years on the island.

St Helena, Ascension Island and Tristan da Cunha together make up a single UK Overseas Territory spread across the South Atlantic. St

Helena has always been regarded as one of the most remote islands in the world, hence why it was selected as the place to exile Napoleon Bonaparte after the battle of Waterloo! However, in October 2017 this changed to some degree when the island opened its first airport, with regular flights from South Africa initially once, and now twice a week.

St Helena has a fascinating history including that of its natural heritage and environment. Geologically the island is a 16x8km lump of volcanic rock sticking out of the South Atlantic Ocean. Its sub-tropical climate has annual temperatures of between 12-33°C with a rainfall circa 250mm in the coastal capital of Jamestown, up to >1000mm in the higher central area. Due to its remoteness the island has a high level of endemism, with circa 45 endemic vascular plant species (and an estimated >450 endemic invertebrates), which is highly significant within the overall biodiversity of the UK and its overseas territories.

Like many populated islands globally, horticulture has been, and is, extremely important for St Helena. Although the scale is not vast, the diversity is great, making it a microcosm of everything horticultural, including food production, plant conservation, landscaping, ornamental gardens and recreation.

Production horticulture

Production horticulture is at the core of St Helena's history. From its inception as a colony, firstly by the Portuguese in the 16th century and then later the English, the island was a re-supply point for Atlantic crossings. Ships would call in to stock up with fresh produce grown on the island – in effect it was a motorway service station for ships. The Portuguese planted large numbers of citrus fruit trees and a whole range of culinary herbs and vegetable crops were brought to the island for production, including melons and pumpkins, many of which thrived and spread and are still widely grown today (some of these intro-



Left: Pallets of fresh vegetables (potatoes and onions) being transported from the supply ship the *MV Helena* to the wharf in Jamestown Bay.

Above: Brassica production on the farm of Colin Thomas at Longwood Fields.

Above right: Leigh Morris teaching plant propagation to some of the first cohort on the SHG Certificate in Agriculture, Animal Care & Conservation at the Harper's Centre at Prince Andrew High School.

Right: Polythene tunnel at Scotland, the headquarters of ANRD, producing the parasitic wasp (*Encarsia formosa*) for the control of whitefly within the island's expanding polytunnel sector.



duced plants however, caused significant plant conservation issues, discussed later).

There are two major crops that have been exported from St Helena. Flax production developed in the late 19th century, and the market for the fibre peaked to supply jute for rope during World War I and II and later in the Korean War. Production ceased when it became less economic in the 1960s. Coffee was reportedly introduced to St Helena from Yemen in 1732 and today there remain a small number of coffee plantations, all producing the original strain of green-tipped Bourbon Arabica Coffee. Regarded as some of the finest coffee in the world, and certainly amongst the most expensive – it is available from high-end UK stores such as Harrods and the East India Company, where a 250g bag of St Helena coffee beans will cost you £170 (www.theeastindiacompany.com/shop/fine-foods/coffee/)!

In addition to coffee plantations, production horticulture on St Helena today consists mainly of traditional field vegetables. The main field production area is the district of Longwood, where approximately ten farmers produce a range of crops, most notably potatoes, brassicas, sweet potatoes, carrots, sweetcorn, onions, pumpkins and squashes. Over the last decade the island has significantly expanded its protected cropping, with funding made available for growers to build and equip polythene tunnels. These are predominantly used for the production of salad crops, typically tomatoes, cucumbers, peppers and lettuce, but some growers are experimenting with, and successfully producing, other crops and the

potential certainly exists to grow much more in this way.

Overall, however, the current amount of produce grown does not meet on-island demand and therefore the bulk of fruit and vegetables (fresh, frozen and canned) is imported via the cargo ship 'MV Helena' that sails monthly from Cape Town. Even with the supplies brought in by ship, the availability of fresh fruit and vegetables in the island shops is extremely limited, and if fresh vegetables appear, you need to buy them quickly.

The majority of the St Helena growers are very small scale – in the UK their holdings would be classed as small market gardens or large allotments. There are, however, a few growers who are aiming to expand their production to meet the island's needs and are being supported by an excellent team led by Darren Duncan and Andrea Timm at the SHG Agriculture and Natural Resources Division (ANRD).

Horticultural upskilling

ANRD have worked with a number of overseas consultants over recent years to develop skills in the sector, including UK horticulturist Ian Gower (<http://www.ighort.co.uk/>), who delivered training on machinery use and pesticide application, and the South African organisation DICLA (<http://www.dicla.com/>) who hosted an exposure visit for key people from St Helena to view agriculture/horticulture production, and then came to the island to deliver training in the use of polythene tunnels.

I was employed as a consultant by ANRD to guide the development of agriculture/horticulture production. My initial task was to carry out a training and development needs review of the sector (report available here: <https://www.sainthelelena.gov.sh/wp-content/uploads/2018/12/Agriculture-Training-Needs-Analysis-Report-Oct-2018.pdf>).

My review identified that, like growers the world over, those on St Helena face challenges. The most significant of these are: access to appropriate technology, pests and diseases, supply/cool chain management, supply of water for irrigation, and labour supply and skills shortage.

Following my research, I was commissioned to deliver several of my recommendations around the development of skills and increasing collaboration across the sector, specifically;

- Facilitating workshops between growers and merchants to explore how more local produce could reach the shop shelves.
- Curriculum development for the island's high school, from Pre-Entry level up to level 2, encompassing agriculture, horticulture, animal care and conservation. The initial cohort commenced in September 2019 and I was delighted to teach the first horticulture classes on plant identification and propagation.
- Delivery and establishment of a Train The Trainer (TTT) course to better enable people in the agriculture/environment sector to pass on their skills. Two of the first graduates then delivered a second course supported by me and will now deliver TTT courses independently in future.



● Supporting delivery of Integrated Pest Management (IPM) workshops with the ANRD Agronomy Extension Team, who, after each completing the TTT course, worked with me to deliver their first two IPM Farmer Masterclasses for growers. These were a great success, and more should follow.

Conservation horticulture

St Helena has become a showcase for the international role of botanic gardens in supporting conservation horticulture. St Helena's flora has been dramatically altered by the actions of humans since the Portuguese first landed on the island over 500 years ago, as a result of felling, erosion, and the introduction of goats, rabbits, non-native plants and plant pests and diseases. Today it is estimated that only about 1% of the indigenous forest, including gumwoods, ebony and cabbage trees remains, and >60% of what was once a tree-covered island is now predominantly bare rock, with a few exotic plant species. The high central Peaks area is still very green, but much of this comprises invasive species, most notably New Zealand flax (*Phormium tenax*). Of the approximately 45 endemic vascular plants on the island some 10 of these are classed as critically endangered under IUCN Red List.

The good news, however, is that species have been saved from extinction and natural habitats are being restored, through the ongoing excellent horticultural work of the SHG Environment Management Division (EMD) and St Helena National Trust (SHNT), supported by international organisations, most notably the Royal Botanic Gardens, Kew and RSPB.

To grow the native plants they need there are three conservation horticulture plant nurseries on the island:

● Millennium Forest Nursery, run by the SHNT,

producing plants of the lower plains' habitat recently, including the first native plants for sale to the public and for landscaping work on the island.

● Peaks Nursery, run by EMD, producing plants specifically for the central Peaks Cloud Forest Restoration.

● EMD Nursery, at their headquarters at Scotland. This is the largest nursery on the island, producing plants from across all habitats and is also the location of the seed bank and an education building.

There is much online about the horticultural conservation work on St Helena, including an excellent (if slightly dated) short film (www.youtube.com/watch?v=bL-pAsNHLdY).

The challenge of restoring the habitat is a huge task, but excellent progress is being made and has been bolstered by recent significant grant funding from the Darwin Initiative to expand the Peaks Cloud Forest Restoration. My perception is that the approaches being adopted on the island, particularly those being carried out in the Peaks Cloud Forest devised and instigated by Lourens Malan, are some of the best examples of ecology-driven horticulture anywhere in the world. Certainly, they are as good as anything I encountered during my ten years working globally for the Royal Botanic Garden Edinburgh.

Beyond the Peaks, other horticultural conservation projects include the well-established George Benjamin Arboretum (named after one of the leading plant conservationists who died in 2012; sthelenaonline.org/george-benjamin-the-man-who-saved-the-st-helena-ebony) and the Millennium Forest Project. In the late 1990s the decision was made for St Helena to embark on a historic reforestation project at the site of the Great Wood. The project was launched in 2000, with huge community support, and under the stewardship of the SHNT has expanded year on year. The total number of trees planted far exceeds

10,000 and the site has now become a place for recreation, education, tourism and a hub of wider biodiversity conservation.

There is currently no botanical garden on Ascension, St Helena or Tristan da Cunha, although a botanical garden was in place on St Helena in the early 19th century, the creation of which is attributed to William Burchell with influence from Joseph Banks. The old site is barely recognisable today (a few of the original trees still remain), but in its heyday the garden was the earliest southern hemisphere botanic garden to be founded in what became the British Commonwealth.

It was one of the most active botanic gardens outside Europe, a resting station for plants being transported around the world and acted as a research station for crop development. Sadly, the original botanic garden declined and was eventually lost, but there is undoubted potential for the island to re-establish a botanic garden and perhaps pull together all the excellent botanical/horticulture conservation work under one St Helena Botanic Garden brand. This would enable St Helena to better engage with the wider global botanic garden network and be an additional attraction for tourists when they visit. The recent establishment of the St Helena Research Institute could be the catalyst to enable this to happen.

Landscape and amenity horticulture

The major landscaping project for the island has been the Landscape & Ecology Mitigation Programme (LEMP), which was originally formed as part of the St Helena Airport Project's Environmental Statement. It was established to provide compensatory habitats and landscaping works to reduce and offset the direct and indirect impacts of the construction of the airport and supporting infrastructure. In recent years the

Right: Looking from the summit of Diana's Peak, the highest point in the green centre of St Helena (823m), overlooking the Peaks Nursery and some of the botanical restoration (with the airport in the distance).

Clockwise from far left: Mass planting of kniphofias in Longwood Garden, the former residence of the Emperor Napoleon.

Ross Henry (one of the E.M.D. Peaks Nursery Team) collecting seeds from the large bellflower (*Wahlenbergia linifolia*). Francis Plain, at Prince Andrew School, is the one sports pitch on the island and a community hub. The ANRD agronomy extension team prior to the first IPM Masterclass (left to right: Ted Whitton, Martina Leo, Rosalie Peters and Freddy Green). A display of local produce at the 2019 Countryside Fair at Francis Plain.

(All photos: Leigh Morris)



LEMP team, in partnership with on-island organisations (notably the SHNT who have now taken on the management of LEMP up to its planned completion date of 2021), have propagated and planted over 70,000 plants, with a 70-80% establishment rate. They have also installed over 10km of rabbit-proof fencing to protect the plants.

St Helena has two notable ornamental gardens: one is Castle Gardens, in the capital Jamestown, which was originally the garden of the East India Company. Today these small, minimally maintained, yet still tidy gardens, are free to enter and are a place where many people meet, talk and eat, and must be traversed to visit Anne's Place, one of the popular restaurants in town. The other is at Longwood House, the former home of the French Emperor Napoleon, who designed the layout of the gardens around his house towards the end of his exile. The layout of raised beds and paths has recently been renovated by the SHNT and the mass displays of kniphofia and then agapanthus within these beds produce truly spectacular displays during the year.

There is a culture of home gardening on St Helena and many local people on the island (the 'Saints') grow ornamental plants and vegetables. The enthusiasm for home growing was well demonstrated at the annual Countryside Fair, for which I was delighted to be one of the horticultural judges.

Traditional grass-based team sports are popular, with the island's one sports pitch at the high school being a strong community hub throughout the year for the highly competitive football and cricket leagues. The island is also home to one of the world's most remote golf courses, which, like the pitch at the high school, is very well utilised. The course, commissioned in 1903 by the then Governor of St Helena, Sir Henry Galway, has adapted rules to suit its partic-

ular fairways and bunkers. St Helena may not have the world's best sports turf, but it certainly is well used and is of great value to the local community.

South Atlantic linkages

Horticulture, particularly the production of food crops, is crucially important on other UK islands in the South Atlantic Ocean: Ascension, Tristan da Cunha and the Falkland Islands. In 2018 I delivered consultancy on Ascension Island to support the roll out of the Ascension Island Government (AIG) waste management strategy and while there I produced a report on the AIG hydroponics farm (www.bluemarinefoundation.com/wp-content/uploads/2019/06/Ascension-Hydroponics-Report-Jan-19.pdf).

The history of hydroponic growing on Ascension is fascinating, with the initial farm being set up by the US military during World War II to provide food for their troops' base on the island (an excellent article on this US farm appeared in *The National Geographic Magazine*, Volume LXXXVIII, Number Two, August 1945). I subsequently liaised with AIG and SHG to facilitate the visit of the SHG Agronomist, Ted Whitton, to Ascension in December 2019 to deliver business support to the AIG farm.

Others from the UK are supporting horticulture development in the South Atlantic. These include Harper Adams University which carried out upskilling for Tristan da Cunha growers (tristandc.com/newsgovneilswainuk2016.php) and horticultural consultant Martin Emmett who led a small team from the UK to carry out a review of production horticulture on the Falkland Islands in 2016. Martin's report *Fresh for the Future – A report on the potential to increase the availability of fresh horticultural produce on the Falkland Islands* can be found online.

My perception is that many of the horticultural challenges the islands face are similar and so provide opportunity for greater cross-island collaboration in the future.

A rewarding two years

My time in the South Atlantic has taught me that the terms natural capital and ecosystems services (and the role horticulture plays within them) have huge resonance on small populated islands, and in my view there is potential for some small islands to become models of sustainability that larger nations may learn from and scale-up.

I found my two years on St Helena, being so intrinsically involved in a such an environmental microcosm, an extremely interesting and educational period. Horticulture on these islands may not have a high status *per se*, but, like horticulture across the whole world, it certainly has critical importance for food production, conservation and human health and wellbeing.

Leigh Morris MSc C Hort FCIHort

CIH Past-President (2012-14) Leigh commenced his horticulture career in 1983. This initially spanned nursery stock production, education and botanical gardens, before widening across broader environmental conservation. Leigh has an MSc in International Horticulture and has worked on several overseas horticultural/botanical projects, including a placement for VSO. Aligned with this interest, Leigh took the opportunity to spend two years in the South Atlantic (2018-19) and he has recently moved from one island to another, by taking up the post of CEO for the Isle of Man Wildlife Trust in January 2020. Leigh wrote a blog about his time on St Helena, including the horticultural work, which can be found at: leigh3666.wordpress.com/category/st-helena-south-atlantic-ocean.

